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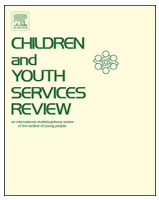

Prevalence of stress, anxiety and depression due to examination in Bangladeshi youths: A pilot study

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ABSTRACT

An estimated 25% people suffer from mental health disorders worldwide. Almost 7 million suffer from anxiety and depression in Bangladesh. There are several factors that can cause stress among youths, both academic and non-academic, ranging from socioeconomic, environmental, cultural and psychological attributes. However, these are not widely researched in Bangladesh. This study identified the factors that affect the mental health of students due to examinations in Bangladesh, particularly the socio-demographic, lifestyle and psychological factors. An online cross-sectional survey was conducted on May 2020 with a sample size of 210 tertiary level students in Dhaka. A modified DASS-21 was used to measure stress, anxiety and depression scores related to examination. Binary logistic model showed that those who lived with family, spent time with parents, had regular sufficient (self-assessed) sleeps and consumed balanced (self-assessed) diets had significantly lower stress, anxiety, and depression. Balanced lifestyle with greater social bonding might help to better equip youths to reduce stress, anxiety, and depression during examination, which could be an avenue for future intervention studies.

1. Introduction

One in four people suffer from mental or neurological disorders worldwide (World Health Organisation, 2001), including 264 million who suffer from depression (World Health Organization, 2020a). A person with depression often functions poorly at work, school or in family environment, which, at its worst, can lead to suicide. Due to depression, suicide is the second leading cause of death for 15–29 year-olds (World Health Organization, 2020a). The global prevalence of moderate to extreme levels of depression is 60.8%, anxiety 73%, and stress 62.4% (Bayram and Bilgel 2008; Beiter et al. 2015; Kulsoom and Afsar 2015). Although not widely discussed, mental health issues are increasingly becoming a threat to low- and middle-income countries such as Bangladesh.

Almost 7 million people in Bangladesh experience depressive and anxiety disorders respectively (World Health Organization, 2020b). An estimate of 10,167 committed suicide in 2012, and suicide attempts were considered by 4% of boys and 6% of girls by youths aged 13–17 years (World Health Organization, 2020b). In Bangladesh, the levels of depression, anxiety, and stress has been reported to be as high as 54.3%, 64.8%, and 59.0%, respectively (Hossain et al., 2014; Alim et al., 2017; Saeed et al., 2018; Mamun and Griffiths, 2019; Mamun et al., 2019).

There are myriads of factors that can cause stress among students, both academic and non-academic, ranging from socioeconomic, environmental, cultural to psychological attributes (Brand and Schoonheim-Klein, 2009). Stress levels vary across students depending on symptoms of anxiety, especially during examination periods. A prevalence rate of 10–35% of university students experience "functionally impairing levels of test anxiety" (Chapell et al., 2005; Neuderth, Jabs and Schmidtke, 2009). Students with test anxiety are more likely to delay and drop-out in university, which could lead to suicidal behaviors and high economic costs (Schaefer et al. 2007). It can be bidirectional as majority of students with stress display poor self-confidence and often poor academic performance (Sohail, 2013; Baste and Gadkari, 2014).

Several contributing factors of stress, anxiety, and depression among students were identified in literature including sex, strained relationships, family and peer pressure, high parental expectation, lack of financial support and hardships, sleep deprivation, future worries, loneliness, longer screen time, toxic psychological environment, academic pressure, workload, size of the academic curriculum, and heavy test schedules (Brenneisen Mayer et al., 2016; Abdel Wahed and Hassan, 2017; Saeed et al., 2018; Silva and Figueiredo-Braga, 2018; ul

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Haq et al., 2018; Mamun and Griffiths, 2019). Some of the major academic stressors for students include examinations, time demands, competition and class environment while the most common personal stressors have been intimate relationships, finance and parental conflicts (Murphy and Archer, 1996).

The stress of examinations and mental health of students are correlated. According to Bayram and Bilgel (2008), exam stress and anxiety has negative impacts on students' academic achievement, physical health & development and standard of life. Causes of exam anxiety can be associated with social stigma, where students from a rural background could feel incompetent compared to those who grew up in the metropolitan, coupled with the fear of not having competitive skills in English, the general medium for higher education in Bangladesh, can demotivate them prior to and during exams which could lead to anxiety, stress, and frustration.

Higher education in recent times involves considerable financial burden (Callender & Kemp, 2000). Richardson et al.'s (2017) cross-sectional survey indicate that financial difficulties often lead to mental disorders such as depression for students. Richardson et al.'s (2017) cross-sectional survey indicate that financial difficulties make students particularly vulnerable to depression. Of all the adverse experiences assessed, financial hardship was the only one to show an independent relationship with depression when pre-entry anxiety and depression were controlled which indicates that the direction of causality is more likely to be from financial problems to depression than vice versa (Andrews and Wilding, 2004). Moreover, excessive parental control is assumed to inhibit the development of children's autonomy, which leads to perceptions of the environment as "uncontrollable and a limited sense of personal competence or mastery" (Chorpita, Albano and Barlow, 1996; Hudson and Rapee, 2001; Dadds, 2002; Barlow, 2004; Chorpita, Brown and Barlow, 2016). In turn, these factors are postulated to contribute to the triggering anxiety in children.

There is a knowledge gap concerning mental health problems in Bangladesh. In 2019, four suicides and one suicide rescued among students attracted media and public attention nationwide, which suggested a need to examine the existing mental health issues among students in Bangladesh (Shamsuddin et al., 2013; Arafat and Al Mamun, 2019). To contribute to that gap, the present study investigated the prevalence of depression, anxiety, and stress among Bangladeshi students and their associated risk factors with respect to socio-demographics and lifestyle measures.

The objective of the study was to identify factors that affect the mental health of students due to examinations, particularly the socio-demographic and psychological factors using a survey conducted in Dhaka, Bangladesh in 2020.

2. Theoretical framework

There are several theories that discuss risk factors associated with individual mental health. These include the social ecologic theory, the social cognitive theory, as well as the social stress model, among others (van Praag et al., 2009; Yen, Michael and Perdue, 2009). The present study was framed by the social ecologic theory and the social cognitive theory.

The social ecologic theory suggests that individual and environment factors are interrelated and that good health can be achieved with behavioral, economic, and social factors promoting it (Krieger, 1994; Cohen, Scribner and Farley, 2000). Thus, the social ecologic theory suggested that a person living in a neighborhood with low socio-economic status (SES) and low social support is expected to have worse health outcomes than someone from a better environment. The theory posits that environmental factors, socio-demographic factors in the current study context, influence the mental health of students. The most common socio-demographic factors discussed in the literature are the student's age, sex, place of residence, education, parents' education, family income, personal income, relationship status, frequency of contact with family and extra-curricular activities.

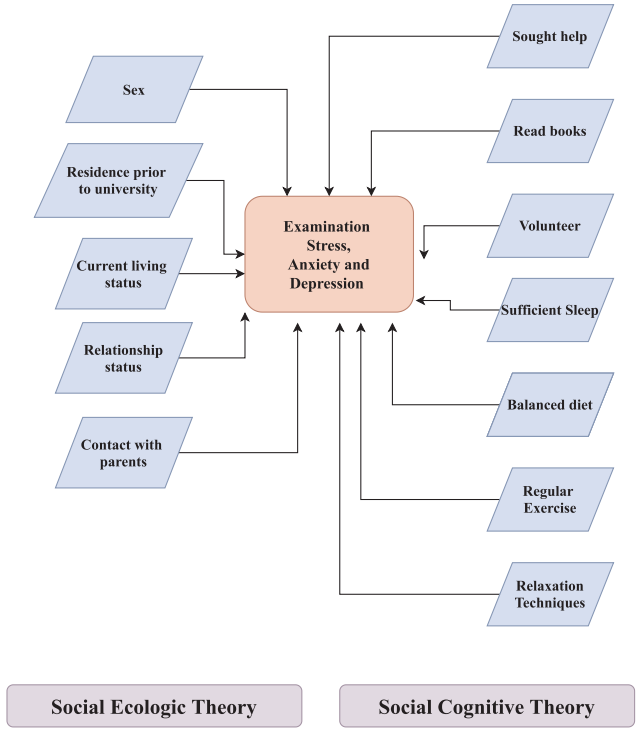

Fig. 1. Theoretical hypothesis for the study based on social ecologic and social cognitive theories.

Social cognitive theory links these socio-demographic factors with the thought processes of students that contribute to their emotional, behavioral and psychological development such as seeking help, reading books, engaging in volunteering activities, getting sufficient sleep, maintaining a balanced diet, getting regular exercise and practicing relaxation techniques (Fig. 1). The theory also suggests that good health is linked to individuals having beliefs that they can achieve healthy outcomes, having goals to achieve these outcomes as well as having expectations of these outcomes. (Bandura, 2004; Fisher et al., 2004).

3. Materials and methods

3.1. Data overview

An online survey was conducted among undergraduate and post-graduate students from tertiary institutions of Dhaka, Bangladesh. Due to the COVID-19 pandemic in Bangladesh, the authors had to settle for online option and could only collect quantitative data. A total of 210 youths aged between 17 and 25 years participated in the survey using google online survey platform after receiving ethical clearance from University of Dhaka, Bangladesh. The data was collected during May 2020.

4. Variables

The survey questionnaire included sociodemographic information as well as DASS 21 Scale which measured examination stress, anxiety and depression, and possible coping mechanisms. Demographic information included sex, residence before joining university, current living status, relationship status, and contact with parents. The Depression, Anxiety and Stress Scale − 21 Items (DASS-21) is a set of scales designed to measure the psychological states of depression, anxiety and stress. There are 7 items in each of the three DASS-21 scales, divided into subscales with similar content. The depression scale

assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest/involvement, anhedonia and inertia (Lovibond and Lovibond, 1995). The anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect during examination. It examines the difficulty to relax, nervous arousal, and being easily upset/agitated, irritable/over-reactive and impatient (Lovibond and Lovibond, 1995). Scores for the three emotional states of mind are calculated by summing the scores for the relevant items. The stress/anxiety coping mechanism included questions regarding whether the participant ever sought help for depression/anxiety/stress, reading habits, engagement in volunteering activities, whether the participant made any effort to replace negative thoughts with positive ones, and self-assessment on quality of sleep and eating habits.

4.1. Statistical analysis

Bivariate distribution of the relevant variables across DASS stress, DASS anxiety and DASS depression were quantified. The primary associations were evaluated using t-tests or analysis of variance (ANOVA). To assess the relationships between the DASS scores and socio-demographic variables, linear regression model was fitted. These models included only the variables that were found significant in the primary bivariate associations. P-value < 0.05 was considered as threshold for the level of significance. All statistical analysis was conducted with *R* (version 3.5.0).

5. Results

The online survey resulted to 210 responses. In the sample 169 were studying in undergraduate degrees, 40 in master's degrees and one in high school and aged between 17 and 25 years.

The validity of the three DASS scores were assessed using Cronbach's alpha. The alpha values for stress, anxiety and depression were 0.84 (95% CI: 0.81 ~ 0.84), 0.80 (95% CI: 0.76 ~ 0.84) and 0.88 (95% CI: 0.85 ~ 0.90) respectively. These show that the scores were reliable.

5.1. Bivariate association

In the bivariate association, variables such as current living status, contact with parents, sufficient sleep and balanced diet were significantly associated with DASS scores during examination periods (Table 1). Most of the participants (N = 145) lived with family but higher scores of stress (21.01), anxiety (17.87) and depression (18.27) were observed for those who lived without family compared to those who lived with family. Similarly, most of the participants (N = 164) had daily contact with family but higher scores of stress (25.63), anxiety (19.09) and depression (24) were observed for those who contacted their family 1–2 times a month compared to those who contacted daily and 1–2 times a week. Moreover, the result suggests that higher scores of stress (21.58), anxiety (17.58) and depression (20.65) was prevalent in those who did not have sufficient sleep compared to the highest number of participants who had sufficient sleep (N = 91). Lastly, participants who did not have a regular and healthy food habit had the highest scores of stress (19.90), anxiety (17.69) and depression (18.05) during examination compared to those who had regular and balanced diet (Table 1). The four significant variables – current living status, contact with family, sufficient sleep and balanced diet were fitted to linear regression model.

5.2. Linear regression model

The linear regression models observed a significant association of contact with parents with stress and depression (Table 2). Those who kept contact with parents only once or twice a month were more likely to have higher examination stress and depression respectively compared to those who contacted daily with their parents. Similarly, sleeping pattern was significantly ($P < 0.05$) associated with stress and depression during examinations. Those who had sufficient sleep were less likely to have higher stress or depression compared to those who self-reported of insufficient sleep. Only diet was associated with anxiety (Table 2). Those who had balanced diet were likely to have lower anxiety during examination period compared to those with unbalanced diet. Also, anxiety was marginally associated ($P < 0.058$) with living status, that is those living without family were more likely to experience anxiety than those living with it. For all the linear regression model, generalized variance-inflation factors (GVIF) were computed and all scores were under 2, which means there were no multicollinearity in the models (Fox and Monette, 1992)

6. Discussion

The results showed that living with family, time spent with parents, sleeping patterns and diets were significantly associated with mental health factors. Given the current study evaluated students who only had mild or moderate stress, anxiety or depression, it could be argued that a balanced lifestyle with sound social communication would help students deal with stress, anxiety and depression related to examination.

Talking with parents daily seemed to be a stress relieving mechanism among youths, as results indicate. Students who talked to their parents daily over phone had the lower stress and depression scores resulting from examinations compared to those who talked 1–2 times a month. A pilot study of children with separation anxiety disorder (Choate et al., 2005) found that a parent–child intervention designed to improve the attachment bond resulted in children no longer fitting criteria for separation anxiety disorder in most cases. That would work for examination stress as well, given, a student who shares the concerns are more likely to receive support and encouraging behaviors from their parents. Social bonding has proved to be a good depression coping mechanism (Karriker-Jaffe, Foshee and Ennett, 2011). Thus, improving the parent–youth attachment, particularly for academic examination related mental health issues, could be an avenue to alleviate excess anxiety and depression.

Students who generally had sufficient sleep regularly had lower examination related stress and depression compared to those who never had sufficient sleep. Recent epidemiological studies suggest that insomnia is not just a typical symptom of depression, rather it could be an independent risk factor for depression in the long run (Hohagen et al., 1993). Although this study did not evaluate a bi-directional relationship, depression is considered to be one of the most frequent and prominent causes of insomnia (Hohagen et al., 1993). However, academic performance might not necessarily be hindered due to insomnia (Taylor, Bramoweth, Grieser, Tatum, and Roane, 2013) but lack of adequate sleep was found to be associated with a range of impairments in terms of academic functioning (Hysing, Pallesen, Stormark, Lundervold, and Sivertsen, 2013). A disruptive sleeping pattern or lack of it during examination period would suggest higher likelihood of stress, which would result in a deterioration in academic performance.

Many young adults face traumatic experiences and mental illnesses during university period. Higher consumption of food due to anxiety is common. More often, anxiety leads to unbalanced diet and overconsumption of processed food, which hampers the bodily functions (Kemp, Bui, and Grier 2013; Weng et al. 2012). In one study, M. Hossain, Naher, and Shahabuddin 2005, found that participants who had healthy food habit had the lowest scores of anxiety, stress and depression respectively whereas students who did not have healthy food habit had the highest scores. Food habit is also affiliated with students who live without family, more often they rely on campus canteens or substandard dormitory cafes. This could lead to less than adequate nutrient intake, particularly when studies have repeatedly questioned nutrition in food sources in Bangladesh (Hossain, Naher and

Table 1
Distribution of stress, anxiety and depression across all variables.

Variable	Category	Sample size (N)	DASS Stress Mean (SD)	P-value	DASS Anxiety Mean (SD)	P-value	DASS Depression Mean (SD)	P-value
Sex	Male	86	17.28 (8.54)	0.167	14.44 (8.46)	0.178	15.48 (9.63)	0.576
	Female	124	19.03 (9.63)		16.08 (8.89)		16.27 (10.49)	
Residence before joining university	Urban	167	17.67 (9.02)	0.060	15 (8.82)	0.176	15.56 (10.12)	0.285
	Rural	43	20.79 (9.65)		16.97 (8.31)		17.44 (10.16)	
Current living status	Live with family	145	17.10 (9.05)	0.004	14.30 (8.55)	0.007	14.91 (9.91)	0.029
	Live without family	65	21.01 (9.06)		17.87 (8.70)		18.27 (10.3)	
Relationship status	Single	154	18.49 (8.85)	0.618	15.48 (8.65)	0.335	16.15 (10.19)	0.692
	Married	3	13.33 (10.06)		8 (8.71)		11.33 (11.01)	
	In a relationship	53	18.07 (10.25)		15.62 (8.96)		15.62 (10.03)	
Contact with parents	Daily	164	17.52 (9.05)	0.011	15.24 (8.66)	0.356	15.13 (9.65)	0.013
	1/2 times a week	35	19.71 (9.43)		15.02 (8.98)		17.25 (11.27)	
	1/2 times a month	11	25.63 (7.68)		19.09 (8.96)		24 (10.39)	
Sought help	Yes	93	18.45 (9.61)	0.849	16.27 (9.39)	0.207	15.48 (10.14)	0.552
	No	117	18.21 (8.92)		14.71 (8.15)		16.32 (10.15)	
Read books	Yes	146	18.05 (9.19)	0.541	14.94 (8.65)	0.252	15.47 (10.16)	0.307
	No	64	18.90 (9.30)		16.46 (8.89)		17.03 (10.06)	
Volunteering	Yes	74	16.94 (8.62)	0.103	14.43 (8.11)	0.219	14.81 (9.56)	0.218
	No	136	19.05 (9.47)		15.94 (9.04)		16.57 (10.41)	
Positive thoughts	Yes	137	18.40 (8.92)	0.844	15.51 (8.38)	0.812	15.21 (9.77)	0.159
	No	73	18.13 (9.47)		15.20 (9.42)		17.34 (10.70)	
Sufficient Sleep	Yes	91	15.53 (8.40)	< 0.001	13.56 (8.12)	0.021	12.74 (8.60)	< 0.001
	Sometimes	76	19.78 (9.46)		16.39 (8.50)		17.13 (10.43)	
	No	43	21.58 (8.93)		17.58 (9.76)		20.65 (10.51)	
Balanced diet	Yes	105	16.72 (8.86)	0.012	13.12 (7.73)	< 0.001	13.84 (9.29)	0.002
	No	105	19.90 (9.32)		17.69 (9.11)		18.05 (10.54)	
Regular Exercise	Yes	40	17.50 (9.25)	0.539	14.35 (8.11)	0.371	13.45 (8.80)	0.058
	No	170	18.50 (9.22)		15.65 (8.88)		16.54 (10.35)	
Relaxation Techniques	Yes	162	18.37 (9.40)	0.866	15.22 (8.53)	0.592	15.37 (10.13)	0.126
	No	48	18.12 (8.63)		16.04 (9.44)		17.91 (9.97)	

Shahabuddin, 2005; Khan et al., 2019). All these are compounded by factors such as financial condition, sufficient resources and facilities which play a major role here.

Higher levels of examination anxiety were observed for students who lived without their family compared to those who lived with their family. Results indicated that youths with higher anxiety level perceived their mothers and fathers as being more socially isolating, more concerned about others' opinions, more ashamed of the students' shyness and poor performance, and less socially active than youths with low anxiety level (Caster et al., 1999). Staying with family reduces their stress, anxiety and depression, particularly during examination, as they could share some responsibilities with their families and focus more on academic workload. This, in turn, relieves some anxiety and improves their mental health.

There were a few limitations to this study. First, there was no active identification of severely stressed individuals to be included in the survey, which might have observed stronger effect sizes in the models. Second, this study was limited to only quantitative data, which means future studies could consider in-depth interviews to explore more focused examination related stress factors. Also, as the sample size was small, the beta scores in the regression model might not be adjusted to reflect population estimates. Thirdly, as the data was cross-sectional, there is hardly a scope to assess a causal link. Based on the study findings, some intervention studies can explore the causal link between healthy lifestyle and mental health related factors during examination in Bangladesh. Moreover, future studies can consider calculating Quality-Adjusted Life Year (QALY) & Disability-Adjusted Life Year (DALY) and assess their impacts. Fourthly, the financial barrier between public universities and private institutions in Bangladesh could act as a stressor, which was not collected in the current survey. Finally, the sample was limited to only youths pursuing higher education in Dhaka, Bangladesh. For more generalized conclusion, wide scale surveys with funding would be necessary.

7. Conclusion

Examinations have a negative effect on the mental health of students in terms of stress, anxiety, and depression. This study explored some demographic factors associated with mental health for Bangladeshi tertiary level students. Balanced lifestyle with greater

Table 2
Linear regression model fitted to the DASS scores with demographic information.

Variable	DASS Stress *b* (95% CI)	P-value	DASS Anxiety *b* (95% CI)	P-value	DASS Depression *b* (95% CI)	P-value
Current living status (ref: Live with family)						
Live without family	2.01 (-0.75, 4.77)	0.152	12.85 (0.917, 179.95)	0.058	0.92 (-2.09, 3.92)	0.548
Contact with parents (ref: Daily)						
1/2 times a week	1.24 (-2.13, 4.61)	0.468	−1.00 (-4.23, 2.22)	0.540	1.65 (-2.03, 5.33)	0.377
1/2 times a month	5.77 (0.20, 11.34)	0.042	1.32 (-4.02, 6.65)	0.627	6.39 (0.31, 12.46)	0.039
Sufficient Sleep (ref: No)						
Sometimes	−1.23 (-4.62, 2.16)	0.474	−0.37 (-3.62, 2.87)	0.820	−3.07 (-6.76, 0.63)	0.104
Yes	−4.58 (-7.92, −1.23)	0.008	−2.16 (-5.36, 1.05)	0.186	−6.39 (-10.04, −2.74)	0.001
Balanced diet (ref: No)						
Yes	−1.64 (-4.14, 0.86)	0.197	−3.61 (-6.00, −1.22)	0.003	−2.59 (-5.31, 0.14)	0.063

social bonding might help better equip fighting stress, anxiety, and depression during examination. Future research could examine the relationship between academic results and its association with stresses and psychological disorders. Amidst the high density of infections and non-communicable diseases, mental health is still not highly reorganized in Bangladesh. Implementation of stress management workshops, improvisation of academic environment, use of problem-focused and emotion focused strategies at the policy level should be targeted. Moreover, students need assistance and co-curricular programming to help them develop "stress-related coping strategies" attuned to performance and the outcomes borne regarding the effects of stress, in particular regarding eustress, where a positive impact has been cited with respect to the effects of stress on financial aid, institutional commitment, academic performance, and intent to persist.

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Ethical clearance

Ethical permission was taken from the Department of English, University of Dhaka, Bangladesh. The responses from the participants were voluntary and consent from them was taken.

Contributor statement

AR Arusha conceptualized the study, conducted online survey, coded the data, framed the manuscript, drafted the manuscript, and conducted the literature review. RK Biswas performed the statistical analysis, drafted the theoretical framework, and critically reviewed the manuscript. The final manuscript was read and approved by all the authors.

Declaration of Competing Interest

The authors declared that there is no conflict of interest.

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